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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE • JUNE 24, 1944

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TECHNOLOGY DEPT.

...gs Over Japan

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A SCIENCE SERVICE PUBLICATION

Television sees Democracy in Action

● AMERICANS have always been eager to share in the political life of our Democracy. This year, the two great political conventions will be filmed in Chicago and the reels will be rushed to New York for broadcasting over WNBT, NBC's pioneer television station.

Four years ago, in 1940, WNBT made television history, by directly telecasting the Republican Convention at Philadelphia and by broadcasting films of the Democratic conclave in Chicago.

When Peace comes, a greater and more widespread television audience—expanding into millions of homes equipped with RCA television—will see as well as hear Democracy in action . . . thanks to the new super-sensitive television camera, and other radio-electronic devices developed in RCA Laboratories.

Today, RCA research and engineering facilities are devoted to creating the best possible fighting equipment for the United Nations. Tomorrow, RCA—Pioneer in Progress—looks forward to supplying American broadcasters, and the American public, with still finer radio, television, and electronic instruments.

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AERONAUTICS

B-29 Superfortress

Half again as large as the B-17 Flying Fortress, this new battleship of the air carries a greater bomb load faster than any other plane in the world.

See Front Cover

➤ THE B-29 Superfortress, the U. S. Army Air Forces' latest battleship of the air, carries a greater bomb load and flies faster, farther, and higher than any other plane in the world.

Facts about this heavy bomber announced by the War Department show that it is half again as large as the B-17 Flying Fortress. It has a wing spread of 141.2 feet, a fuselage 98 feet long and when it rests on the runway it is as tall as a three-story building, 27 feet.

Four engines with 8,800 maximum horsepower thrust it through the air at speeds in excess of 300 miles an hour, and the largest propellers ever produced by mass production, four blades of 16.5 feet diameter, apply this greatest power a plane has ever had.

The range of the B-29 is not revealed but it is known to be well in excess of the 700 mile radius of combat operation credited to the B-17. The bomb load is also still a secret, but it is known to be larger than the 6,000 pound load the Flying Fortress carries. Its practical altitude can extend above 30,000 feet, more than six miles in the air.

The B-29 has more fire power than most planes in use today. Announced armament includes multiple 50 caliber machine guns and 20 millimeter cannon. These are installed in power turrets.

The slender tapering wings, set far behind the elongated nose, are built for speed and range. The wings carry greater loads of fuel and bombs than any wings ever built.

The new B-29 is nearly all-electrically operated. With the exception of the hydraulic braking system, every piece of moving equipment is operated by an electric motor or cable controlled by the co-pilot and flight engineer.

Dual tires, the first used on any airplane, are used on the tricycle landing gear. The great weight of the bomber makes a dual tire nose wheel essential so that the gear will operate satisfactorily, even if one tire blew out.

The development of the B-29 was conducted in greatest secrecy during the past four years. Bell, Martin, and Fisher Body Division of General Motors joined forces with Boeing to produce this larger, faster bomber. The B-29 Superfortress is the result of making a magnified and improved composite of the Aircobra, Marauder, and Flying Fortress.

Today, B-29's are being produced in large numbers in the greatest manufacturing program ever put behind a single implement of war, involving six of the largest aircraft factories in the United States.

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PUBLIC HEALTH

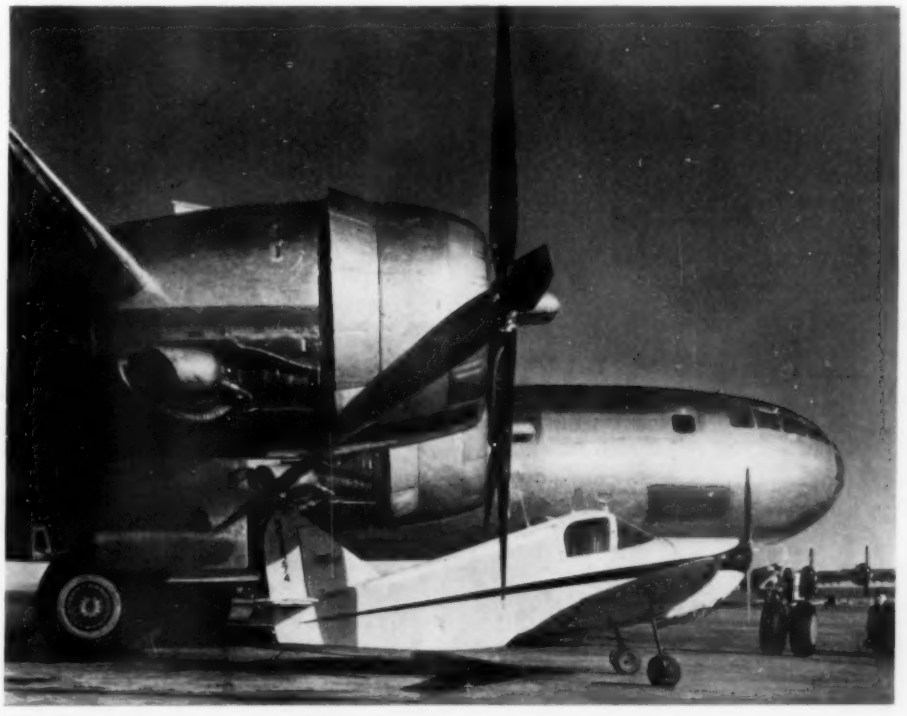
Children Will Receive Protection Against Measles

➤ MEASLES protection will be available to America's children, and grown-ups too, if necessary, through a by-product of blood donated by patriotic citizens all over the country to the Red Cross for the nation's fighting men.

The protection will be given by a substance called gamma globulin, separated from blood plasma by Dr. Edwin J. Cohn of Harvard University. (*See SNL*, May 27) The globulin can be used either to prevent measles or to modify the attack so the patient is not very sick but develops resistance to further attack. The American Red Cross, functioning as coordinator, will assist in transferring the measles preventive from the manufacturers to state and local health departments. These will pay the cost price and distribute the material without charge.

Announcement of this latest development of the blood donation program comes from the Navy Department with a detailed progress report by Vice Admiral Ross T. McIntire, Surgeon General of the U. S. Navy.

Fully a year before Pearl Harbor the Navy's Bureau of Medicine and Surgery began the project which has yielded gamma globulin for the prevention or modification of measles; concentrated serum albumin for saving lives threatened by shock from battle wounds; fibrin film and fibrin foam which are proving valuable in surgery of battle wounds, espe-



***HIGH ALTITUDE BOMBER**—Towering above a single engine reconnaissance plane is the giant four-engine Boeing B-29 Superfortress, equipped to carry the heaviest load of bombs, faster and farther than any other plane. Used recently in a heavy bombing of Japan, the B-29 will soon be hammering away in war theaters.*

cially brain surgery; and blood grouping globulins essential in blood typing procedures before transfusions.

First aim of the program was to develop a concentrated protein for treatment of shock that would be lighter weight and less bulky than blood plasma. The mobile nature of Naval and Marine operations and the need to conserve space in all types of ships, planes and land vehicles, dictated this need. It was filled when, in 1940, Dr. Cohn perfected a process for separating the protein fractions of blood plasma and Capt. Lloyd R. Newhouser, of the Navy Medical Corps, developed a satisfactory dispensing package for the albumin which was to replace plasma in many cases.

When, after months of painstaking tests of the albumin as a shock-reliever, the Navy finally let contracts to manufacturers for processing it, a foresighted clause was included directing them to store at low temperatures the plasma fractions which remained after the albumin was removed. As a result, the various by-products of albumin processing were available as soon as their usefulness was established.

Cooperating with the Navy in the program which has developed these valuable products for Navy, Army and, now, civilian use, are the National Research Council and the Committee on Medical Research of the OSRD.

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PUBLIC HEALTH

Penicillin for Syphilis

Large-scale treatment undertaken for disease in the early stages at more than 50 rapid treatment centers. Already successful for gonorrhea.

➤ LARGE-SCALE use of penicillin in the treatment of early syphilis is being undertaken by the U. S. Public Health Service and a number of state health departments, Medical Director J. R. Heller, Jr., Chief of the Public Health Service Venereal Disease Division, announced.

Selected patients with early syphilis will receive penicillin in rapid treatment centers, of which there are more than 50 in the United States. Thirty-six centers in 18 states are already participating in the penicillin program. The drug has already been successfully used at these centers for treating gonorrhea cases which did not respond to sulfa drugs.

Studies of the effectiveness of penicillin in the treatment of syphilis will be conducted by the Public Health Service in cooperation with the National Research Council.

"This program of penicillin therapy for syphilis is a research as well as a treatment program," said Dr. Heller. "If these studies prove that penicillin is as effective as everyone hopes, we will be armed with a powerful new weapon in the national fight against syphilis."

"The effectiveness of penicillin in the treatment of syphilis has not been fully evaluated," Dr. Heller pointed out. "However, evidence of its possibilities, following the original treatment of syphilis patients by PHS physicians at Staten Island in 1943, is sufficient to warrant its large-scale use in the interest of public health.

"It is of interest that about one-third of all the syphilis patients admitted to rapid treatment centers are infected also with gonorrhea. Penicillin has already proved its value in treating gonorrhea. If it should prove equally as effective in treating syphilis it would be possible, for the first time in medical history, to treat patients with both these venereal diseases with a single drug."

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CHEMISTRY

Fruit Juice Concentrated By New Method

➤ CITRUS FRUIT juice may be concentrated to about one-fourth of its normal volume to save space in storage and shipping by a new method developed by Dr. A. L. Stahl of the University of Florida Agricultural Experiment Station. Housewives, by adding three quarts of water to one quart of the concentrate, will have a gallon of normal juice.

In the method developed by Dr. Stahl, the juices of mature fruit are extracted by reaming, then placed in a constant freezer and frozen to a slush consistency. The water in the juice freezes, while the minerals and other dissolved solids and other valuable parts remain in a semi-liquid state. The partly frozen mixture is then placed in a centrifuge revolving at moderate speed. The action separates the juice from the icy part of the slush.

The process is still in an experimental stage. A pilot plant is to be set up by the State Citrus Commission and the college station to develop commercial production methods.

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SCIENCE NEWS LETTER
Vol. 45 JUNE 24, 1944 No. 25

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NORTH 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents. Monthly Overseas Edition: By first class mail to members of the U. S. armed forces overseas, $1.25 a year. To others outside continental U. S. and Canada by first class mail where letter postage is 3 cents, $1.25; where letter postage is 5 cents, $1.50; by airmail, $1.00 plus 12 times the half-ounce airmail rate from U. S. to destination.

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Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation, Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STAte 4489.

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PUBLIC HEALTH

Saves Manpower

Daily doses of sulfadiazine have cut down rheumatic fever, pneumonia, scarlet fever and sore throats for soldiers and sailors.

➤ HOW SMALL daily doses of sulfadiazine protected soldiers and sailors from rheumatic fever, pneumonia, scarlet fever and streptococcus sore throats, with an enormous saving in effective manpower and money, was reported by Col. W. Paul Holbrook, of the Office of the Air Surgeon, and Comdr. Alvin F. Coburn, of the Navy's Medical Corps, at the meeting of the American Medical Association.

"Our army of 7,000,000 troops spent in excess of 14,000,000 days in the hospital last year because of common respiratory diseases," Col. Holbrook stated. "In addition to this time, there were the inevitable number of complications and deaths as well as additional millions of man-days lost from duty. If our experience with sulfadiazine prophylaxis holds true, it is a conservative estimate that 50 to 75% of this tremendous loss could be prevented."

At a single Naval Training Station, Comdr. Coburn reported, it is estimated that the liability for just four respiratory infections, scarlet fever, rheumatic fever, pneumonia and tonsillitis or pharyngitis, was 1,671,171 man-days and $15,000,000 in salaries and pensions for disabilities. The figure for man-days covers 557,057 days lost by the patients plus the time of the two well persons whose services are required to care for each man on the sick list.

Part of the Navy's long term program for controlling streptococcal infections now is mass prophylaxis with sulfadiazine. Prophylactic doses of this drug, he reported, have been given continuously to 250,000 Naval trainees between December, 1943, and April of this year. A small dose, one gram daily, is adequate, he reported, to check a well-advanced streptococcus outbreak, to check a streptococcus outbreak at its onset, and to protect 85% of susceptible recruits from implantation with bacteria that cause disease of the nose, throat and lungs, with their often disabling results such as the heart damage that follows rheumatic fever. This last, though not usually considered a respiratory disease, in most cases follows streptococcus infection.

The only untoward effects of the mass sulfadiazine prophylaxis, Comdr. Coburn said, were quickly-disappearing rashes in about four out of every thousand and dangerous constitutional disturbances in one out of 100,000.

He emphasized the fact that while a short course of sulfadiazine prophylaxis checks an outbreak of meningitis, for prophylaxis against streptococcus infections the sulfadiazine must be given every day continuously.

Among recruits with a high occurrence of infection, the sulfadiazine prophylaxis was estimated to save 343 man-days per 1,000 per week, Comdr. Cobhrn reported to the meeting.

At one recruit camp with a complete turnover of personnel every four to six weeks, half the men were given sulfadiazine prophylaxis during the investigations of its effects and the other half was not. Sick call visits for respiratory symptoms among the untreated group were twice that in the treated group. Respiratory sickness requiring bed care in the untreated group was about three times that in the treated group. Infections probably caused by streptococci in the untreated group were 11 times that in the treated, and frank (or definite) streptococcus infection in the untreated was 24 times that in the treated.

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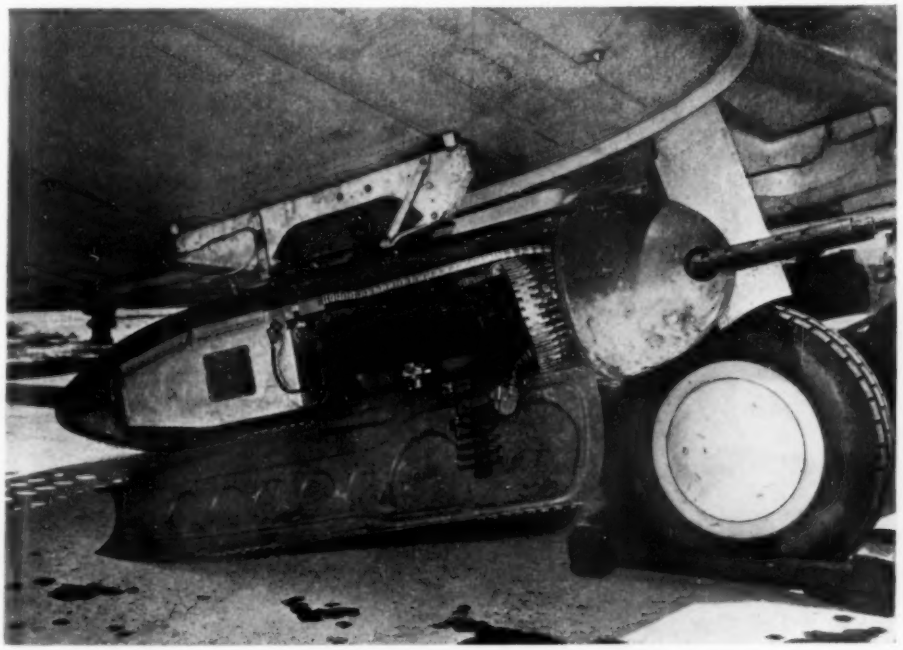

PACKAGE GUN—This machine gun is attached to the underside of the wings of Navy warplanes for added firepower.

AERONAUTICS

Bomb-Like Gun Package Now Attached to Planes

➤ A NEW self-contained machine gun package that is hooked on under the wings of a plane like an ordinary gasoline tank is the latest secret weapon to be revealed by the U. S. Navy.

The gun packages are longer and more cigar shaped than a 2,000 pound blockbuster. They weigh more than 350 pounds each. The main reason for using these guns is to increase the fire power of planes.

The new units are attached to the under part of the wing by sway-braces, the same as are used for bombs, so that the plane may carry bombs, auxiliary gasoline tanks, or the new machine gun packages without substantial alteration.

Although the new gun packages are not intended to be dropped after the fire power is exhausted, as in the case of detachable gas tanks, they may be jettisoned, or dropped, like gas tanks in an emergency when a quick get-away is necessary.

Details of the caliber of the gun and

the amount of ammunition each of these gun packages carries is still withheld by the Navy.

The new and deadly weapon was developed by the Navy, with the cooperation of the Douglas Aircraft Company. Facts show that two gun packages can increase the fire power of some types of aircraft as much as 100%.

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PSYCHIATRY

Three-Day Schizophrenia

This combat disease has all the symptoms of ordinary schizophrenia, with hallucinations even more frequently. Disappears quickly.

➤ "THREE-DAY schizophrenia," a mental illness reported by medical officers in this war, was described to the meeting of the American Psychopathological Association in a report by Comdr. Francis J. Braceland and Lieut. Comdr. Howard P. Rome, medical officers of the U. S. Naval Reserve.

This new combat disease affecting young people has all the symptoms of schizophrenia, which is the most common of mental illnesses. Minds are confused. The men hear imaginary voices and see things that are not there. These hallucinations occur even more frequently than in ordinary schizophrenia. But within three to five days, the illness disappears and the men are well again.

Rest and a nerve-quieting drug bring about "miraculous changes in very short periods of time," the Navy doctors reported.

Despite the fact that this three-day illness is brought on by combat or other trying conditions of stress, it is probable that its development depends more on the background personality than on the type of duty, the officers explained. Some individuals, it would seem, are predestined to develop this type of mental illness if or when circumstances are difficult enough to precipitate it. This disease probably occurs in civilian life but generally is not seen by a psychiatrist.

The number of cases of mental disease (psychoses) of all sorts is far below that in civilian life, the Navy doctors emphasized. Of those Navy cases who do have to go to a mental hospital, 65% are discharged from the hospital, free of symptoms at the end of three months and another 20% are discharged at the end of the next three months. This is a very high and rapid recovery rate.

Most of the men who must be discharged from the Navy for mental or emotional reasons do not have any mental disease but are merely unsuited for military service, the report states. In the group who had to be discharged for inadequacy and emotional instability, 90% would get along all right in civilian life, and whether they will ever require psychiatric treatment will depend on later events, the officers said.

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HEAT RESISTANT—Dr. Reid Fordyce and Dr. David Mowry illustrate the advantages of the new plastic, Cerex. Here you see two combs which have been dipped into boiling water. The one on the right is of ordinary plastic, the other of Cerex.

CHEMISTRY

Heat-Resistant Plastic Retains Strength and Shape

➤ A NEW heat-resistant plastic that can withstand boiling, and dry heat as high, has been announced by the Monsanto Chemical Company.

Developed by Dr. Reid Fordyce and Dr. David T. Mowry, the new plastic has already found wide use in war work, particularly radar, radio and other military electronic equipment where materials of light weight, suitable electric and great heat-resistant properties are needed. It is also being used for surgical instruments, since it can be sterilized.

Dr. Charles Allen Thomas, director of Monsanto central research laboratories, describes the new plastic as "a thermoplastic, readily moldable in standard molding machines, and combining high resistance to heat with resistance to strong, corrosive chemicals, excellent electrical insulating properties, and high rigidity and strength."

The new thermoplastic is a synthetic co-polymer containing carbon, hydrogen and nitrogen. Officers of the Monsanto Chemical Company are withholding any additional information about the new plastic, including its exact chemical composition, pending action on patents. The plastic has been given the commercial name Cerex.

After the war, a wide range of civilian applications are possible, wherever heat-resistant qualities are in demand, such as in dishes and utensils.

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Science Service, Washington, D. C.

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PAGE	TITLE BEGINS	CORRECTIONS
34	Fundamentals of	Col. 8, par. 7, line 4, lower *for* faster; par. 8, line 2, decrease *for* increase.
67	Titan's Atmosphere	Par. 4, line 7, molecular *for* atomic; line 8, atom *for* molecule; line 11, molecules *for* atoms. Par. 5, line 3, four *for* five. Col. 2, line 4, *delete* atomic; line 5, molecular *for* atomic.
89	Paragraph G	Yolk *for* yoke.
101	Star "Playing Catch"	Line 7 *to read*, Yerkes and MacDonald Observatories of the Universities of Chicago and Texas.
136	Blimps Maneuverable	Line 9, ten *for* nine.
156	Do You Know?	Par. 3, line 2, was *for* is.
185	Complex Relative of TNT	Line 8, 2-chloro-6-nitrotoluene *for* dichloro-hexanitrotoluene.
198	Featherless Pigeons	Lines 1 and 2, *delete* naked as on the day of their hatching.
210	Erupting Vesuvius	Col. 3, par. 2, line 7, sulfide *for* disulfide.
275	Fine Quartz Filaments	Col. 3, lines 1 and 2, *delete* in a relatively new method.
292	2-Cycle Engine	Par. 2, line 8, at the expense of *for* without.
294	Arthritis Pain	Col. 2, par. 3, line 3, University of Minnesota *for* Mayo Clinic.
326	Stop Salt Loss	Dr. Margaret W. Johnston of Ann Arbor was co-investigator.
378	Man-Made Quinine	Par. 2, line 3, B *for* W.

ASTRONOMY

Names Reveal Changes

Two constellations now seen in July were once one. Their old names have survived. The scorpion, archer and teapot are visible.

By JAMES STOKLEY

➤ FOR THE characteristic constellations of this time of year, look to the south. Most conspicuous is the figure of Scorpius, the scorpion, with bright red Antares, and the curved row of stars to mark the animal's tail. To the right is the figure of Libra, the scales, made principally of five stars forming a rather irregular pentagon, and with a sixth star hanging from the lower left corner.

The two brightest of these stars have rather peculiar names—"Zubeneschamali" and "Zubenelgenubi." These are Arabic, like so many of the popular star names. The "Zuben" part means "claw." "Eschamali" means "northern" and "elgenubi" means "southern." These apply to their relative positions in the sky, but the claw part of the name seems to have little to do with a pair of scales. Actually, these names go back long ago, when what we call Libra was really part of the scorpion, and they were really northern and southern claws. Though the stars were separated to form a new constellation, the old star names have survived.

All these stars are shown on the accompanying maps, which picture the skies as they appear at 11:00 p.m., your war time, on July 1, and about 10:00 p.m. in the middle of the month.

To the left of the scorpion is the figure of Sagittarius, the archer. It isn't easy to see an archer there, but you can find a teapot. The spout is close to the scorpion's tail, and the handle is farther to the east. During the night, as the sky seems to move on account of the earth's turning from west to east, the teapot tilts, as if it were pouring its hot tea on the scorpion's tail! Incidentally, on Dec. 21, the shortest day of the year, when winter commences, the sun is in the part of the sky directly over the spout of the teapot, which, of course, is then invisible.

There is another bright star in the south, in the constellation of Virgo, the virgin, which is to the right of Libra in the southwest. This is called Spica. Virgo, Libra, Scorpius and Sagittarius are all constellations of the zodiac, the figures through which the sun, moon and planets seem to move. No planets are easily visible this month, but you can see the moon go through this part of the sky at the beginning of July, and again at the end of the month.

Above Virgo is Bootes, the bear-driver, and in this figure is Arcturus. Another way of finding Arcturus is to locate the great dipper in the northwest, and to follow the curved lines of the dipper's handle to the south, when it brings you to this bright star.

The most brilliant star on view these evenings, however, is not Arcturus, but Vega, in Lyra, the lyre, which is high in the east. Two fainter but interesting groups are between Bootes and Lyra. Next to Bootes is a semi-circular row of stars, Corona Borealis, the northern crown. Between Corona and Lyra is Hercules, the strong man. Somewhat incongruously, the stars in Hercules are arranged to form a pretty good butterfly!

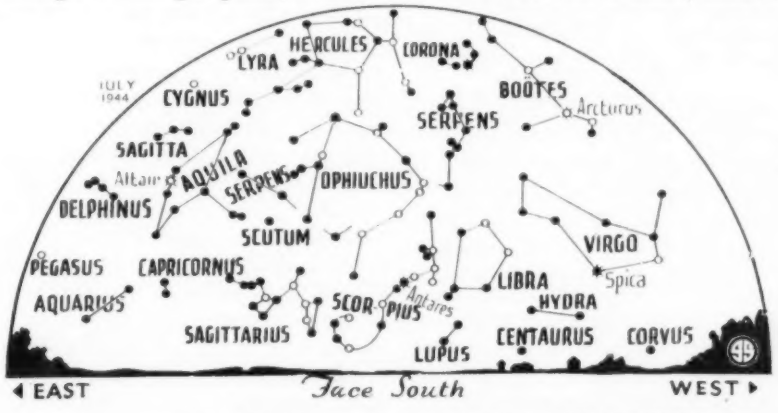
Two other magnitude stars are shown on the maps. Cygnus, the swan, is just below Lyra, and in it is Deneb. To the right of Cygnus is the bright star Altair, in Aquila, the eagle. This star can be recognized without trouble because there is a fainter star just above and just below it.

Though the moon always seems to have the same diameter approximately, even though it changes phase, its size does vary during the month, on account of changing distance. In July for example, it is closest on July 8, at a distance of 226,600 miles. Then two lines to the earth from opposite edges would meet at an angle of about 32¾ minutes. (A minute of arc is a sixtieth of a degree, and a degree is a ninetieth of the distance from the horizon to the zenith.) On July 24, on the other hand, the moon will be farthest, 251,900 miles away, so its diameter will then make an angle of about 29½ minutes.

The sun, too, changes its distance from the earth during the year, and on July 3 is farthest, at a distance of 94,450,000 miles, compared with its closest of 91,342,000 miles on Jan. 4. This means that its diameter in the sky changes also, but not as much as the moon does. Now it is about 31½ minutes, while in January it was slightly more than a minute of arc larger.

Comparing the figures given for the sun and the moon, it will be noticed that sometimes the moon is the bigger, and sometimes the sun. The result is that we have two kinds of solar eclipses, which occur when the moon comes in front of the sun. If there is an eclipse when the moon's diameter is bigger, the sun is completely covered, and then the eclipse is total, making possible many scientific observations which can be made when the solar disk is hidden. Such an eclipse occurred last January, and was visible in Brazil.

This month the year's second eclipse of the sun will happen on July 20, but that date is not far from the 24th when the moon's diameter is least. Actually, on the 20th, its angular diameter will be a little over 30 minutes, about a min-



☼ ✷ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Do You Know?

Sawdust is successfully used as a mulching material by gardeners.

America's first *Diesel* streamline railroad train is now 10 years old.

Fine quality *syrups* are now made from starchy cereal grains other than corn, including sorghum grain and rye.

More than 18,000 *dogs* were enlisted in 1943 for war service with the American forces.

Magnesium, it is reported, can be used instead of zinc in any dry battery and increases the voltage considerably.

Female meadow mice have their first young when about *six weeks old,* a record among mammals.

A new type of dental burr with a *chrome finish* will outwear the present steel burrs at least 50%.

New wartime *insecticides* are carefully tested on both insects and plants, as a satisfactory insecticide must be toxic to the insect and harmless to the plant.

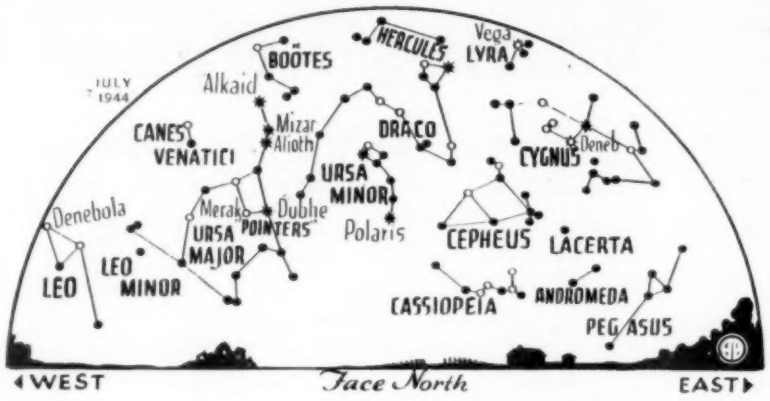
Common *salt* consumption may be used as an index of industrial activities because 97% of the total salt production is used in the industries either as salt or a chemical manufactured from salt.

The importance of *chromium* as a war metal is indicated by the present use of 87% of the available supply of chrome chemicals for military requirements.

Only about 10% of the *castor oil* produced is used medicinally, the remainder being used as a hydraulic fluid, in the manufacture of sulfonated oil, and for many industrial purposes.

The light wood of the *balsa tree* is commercially mature when the tree is from five to seven years old; about 12 years later the wood tends to solidify and becomes too heavy for its unique uses.

Seventy ugly Argentine *toads* have recently been brought by airplane to Florida to destroy insects, larvae and worms preying on the sugar cane; scientifically the toads are *Bufjo paracnemis* and *B. arenarum.*



ute and a half smaller than the sun. The moon will go in front of the sun on this date, but will not entirely cover it, even when the two bodies are directly in line with us. Instead, a ring of sunlight appears around the black lunar disk, and this is called an annular eclipse.

The eclipse of July 20 will not be visible in the United States, but large numbers of our fellow citizens will see it, for the path of visibility, along which the ring of the sun will appear surrounding the moon, crosses Africa, the Indian Ocean, India, the Bay of Bengal, Burma, Thailand, the South China Sea, Mindanao and the northern coast of New Guinea. Over a larger area, including the southern half of Asia and most of Australia, there will be a partial eclipse, with the moon crossing the sun to one side of its center.

Celestial Time Table for July

July	EWT	
3	2:00 a.m.	Earth farthest from sun, distance 94,450,000 miles.
6	12:27 a.m.	Full moon.
8	6:00 p.m.	Moon nearest, 226,600 miles.
12	4:39 p.m.	Moon in last quarter.
18	4:11 a.m.	Moon passes Saturn.
20	1:42 a.m.	New moon—annular eclipse of sun.
	3:52 p.m.	Moon passes Venus.
22	3:44 p.m.	Moon passes Jupiter.
23	5.35 a.m.	Moon passes Mars.
24	1:00 p.m.	Moon farthest, 251,900 miles.
28	early a.m.	Meteors of delta Aquarid shower.
	5:23 a.m.	Moon in first quarter.

Subtract one hour for CWT, two hours for MWT, and three for PWT.

Science News Letter, June 24, 1944

CHEMISTRY

Sugar Synthesized

➤ SUCROSE, the ordinary cane or beet sugar of our tables, has been produced synthetically for the first time, in the laboratory of the University of California at Berkeley. The work was carried out by a three-man team consisting of Dr. Michael Doudoroff, Dr. H. A. Barker and Dr. W. Z. Hassid.

Raw materials for the synthesis were the chemically simpler sugars, fructose and glucose phosphate. Acted upon by an enzyme extracted from a species of bacterium, *Pseudomonas saccharophila,* these were converted into crystals of pure sucrose indistinguishable from the natural product.

The process has no present or immediate prospective commercial value. Only about two grams of sucrose have been synthesized, and the cost of laboratory production is naturally very high. Principal value is to be found in the advance in chemical knowledge about the formation of sugar which the research has brought about.

Science News Letter, June 24, 1944

ENGINEERING

New System of Gears For Turbine Locomotives

➤ TURBINE locomotives are brought nearer to realization by a system of gears invented by W. A. Brecht of Wilkinsburg, Pa. The high speed of the turbine is reduced to the relatively low speed of the drive wheels through three steps. Side rods link all drivewheels together insuring rotation at the same speed. Rights in the patent, No. 2,351,479, are assigned to Westinghouse Electric & Manufacturing Company.

Science News Letter, June 24, 1944

PALEONTOLOGY

Vanished Giants

Remains of a story-book ogre whose fossilized teeth are six times as big as modern man's and twice as big as gorilla's are reported.

➤ GIANTS that once lived in China would fit story-book descriptions of ogres, for their fossilized teeth are six times as big as modern man's and twice as big as a gorilla's. Far to the south, in Java, were other giants with jawbones much bigger than those of any known human being's, living or extinct.

All that is known of these huge but vanished men is summarized (*Science*, June 16) by Dr. Franz Weidenreich of the American Museum of Natural History. A more detailed report is now in the hands of the scientific publishing firm, Chronica Botanica, and will be in print soon. His information had to be gleaned from a few fragments—a couple of jaw-bones found in Java and three gigantic teeth dug out of a drawer in a Chinese apothecary's shop in Hong Kong. Tantalizingly, further search for more complete skeletal remains of these giants must await the expulsion of the Jap dwarfs from the lands they inhabited, far back in Ice Age days.

Hints of the former existence of outsize ancient men first began to turn up in Java, from the same series of fossil-bearing beds that more than half-a-century ago produced the then almost incredible bones of the famous *Pithecanthropus erectus*. In 1937 and 1938, two skulls of *Pithecanthropus* type were found there by Dr. R. von Koenigswald, of the Geological Survey of Netherlands Indies.

In 1939, Dr. von Koenigswald's native collector brought in a fossilized upper jaw from the same site. It is larger and more massive than any known fossil or recent human jaw; although it has an ape-like gap between canine and incisor teeth, the teeth themselves, and associated structures, are distinctly human and not ape-like. The brain-case, found some weeks later, is much bigger than the known *Pithecanthropus* skulls, principally because of the thickness of its bones, and the size of its great eyebrow ridges and a crest that runs over its top. A matching fragment of a lower jawbone was also found, a few months later in the same year.

Drs. Weidenreich and von Koenigswald continued to regard these fossils as belonging to *Pithecanthropus*, despite their greater size. However, a lower jawbone found by Dr. von Koenigswald in 1941 made this conservative classification impossible; it was simply too big to fit in. So Dr. von Koenigswald gave it a new name: *Meganthropus paleojavanicus*, which means big man of ancient Java. It may be that the large skull found in 1939 will prove upon reexamination to belong to this new species also.

Discovery of evidence for the former existence of human giants in China was not made by digging in the field, but by digging in Chinese apothecaries' stocks-in-trade of fantastic *materia medica*. Dr. von Koenigswald knew that these Celestial medicine-vendors deal in fossil bones and teeth, which they pound up for their potions, so whenever he could he rummaged through their boxes and drawers.

Between 1934 and 1939 he found, in such apothecaries' shops in Hong Kong, three molar teeth, evidently either simian or human, but six times as big as any human teeth ever seen. He took them at first for apes' teeth and accordingly named the vanished species to which they had once belonged *Gigantopithecus blacki*, or Black's giant ape. (The specific name was given in honor of the late Dr. Davidson Black, original discoverer of Peking man.) Dr. Weidenreich's reexamination of the teeth, however, has convinced him that they are human despite their great size, so he suggests a renaming: *Gigantanthropus*, which means giant man.

Dr. Weidenreich concludes his discussion with the suggestion that the original human beings may have been big, massive-boned creatures: "The occurrence of large fossil human skulls with very thick individual bones in early or late stages, for instance in *Homo soloensis, Homo rhodesiensis* and in the Heidelberg jaw, seem to indicate that gigantism and massiveness may have been a general or at least a widespread character of early mankind."

The Javanese giants may have been, he estimates, of "the size, stoutness, and strength of a big male gorilla."

Dr. von Koenigswald was still on the island of Java when the Japanese invaded, and his present whereabouts is unknown. Since he could not communicate with him to obtain his consent to announcing details of his discoveries, Dr. Weidenreich obtained official permission from the Board for the Netherlands Indies, Surinam and Curacao.

Science News Letter, June 24, 1944

PHYSICS

Dr. Morton Mott-Smith, Physicist, Is Dead

➤ DR. MORTON C. MOTT-SMITH, Science Service staff writer in physics, died on Friday, June 9, after an illness of several months. He was 66 years old.

Although he joined the staff of Science Service less than three years ago, he completed since then two important fundamental texts in physics for use in high schools and by soldiers and adult civilians.

One of these, "Fundamentals of Electricity," has had total printings of over 650,000, including editions for the Army and a translation into Spanish.

Dr. Mott-Smith, as staff writer for Science Service, reported many of the recent important advances in physics.

Born in Hawaii on Nov. 26, 1877, Dr. Mott-Smith was graduated from the Massachusetts Institute of Technology in electrical engineering and got his Ph.D. in physics, philosophy and mathematics at the University of Halle, Germany. He was professor of physics at Colby College and George Washington University.

Other books by Dr. Mott-Smith include: "This Mechanical World," "Heat and Its Workings," and "The Story of Energy" in the Appleton New World of Science series. He was co-author of a Science Service-Infantry Journal book now in press: "Fundamentals of Mechanics."

Science News Letter, June 24, 1944

★ ★ ★ ★ ★ ★ ★ ★ ★ ★

WYOMING

Yes, even THIS summer you may fish in its mountain streams, ride horseback through its hills and canyons, find Indian relics and marine fossils in a region of great historical and geologic interest.

The Patons welcome a limited number of guests at their ranch in the Big Horn country. They offer plenty of ranch grown food, comfortable cabins and gentle horses. May they tell you more? Write:

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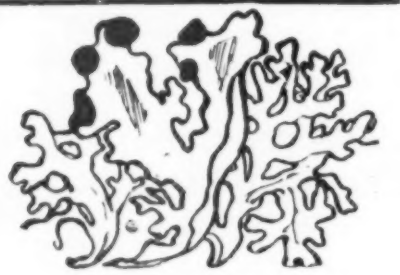
ECOLOGY

NATURE RAMBLINGS by Frank Thone



The Meek Inherit

➤ WHENEVER anyone quotes the Third Beatitude, wherein the meek are promised the heritage of the earth, some flip cynic is almost certain to comment: "Oh, sure! They'll inherit it when everybody else is through with it and doesn't want it any longer."

That may be good for a short laugh, yet it is a serious and solid fact that the meek are constantly inheriting the wasted and worn-out parts of the earth —and are patiently redeeming them.

The meek, in this case, are the whole community of small and inconspicuous plants which the common phrase loosely lumps together as "mosses."

Life habits of the many hundreds of different plant species that make up this rather miscellaneous conglomeration are as diverse as are their botanical kinships; but one thing they have in common: they can stand conditions too difficult for the endurance of those vegetable aristocrats that are generally termed the higher plants. So when a flood or a landslide, a forest fire or a disastrous cycle of soil erosion, makes any part of the earth uninhabitable by loftier green folk, these unregarded meek creep in on the denuded soil, or even on the bare-scraped rock, take possession, and start life over again.

On naked rock, sun-scourged in summer and storm-blasted in winter, generations of lichens manage to cling. Often a careless eye might mistake some of them for splotches of spilled paint or natural mineral outcrops, but they are plants and they are alive. They may grow so slowly that you cannot see any change in a lichen-patch in a decade or a century, but they do hang on and thus hold a frontier of life against encroaching Emptiness.

On the opposite frontier, where the discouragement is not drought but drowning, we are apt to find a larger assortment, and certainly more rapid growth. We find the true mosses in great abundance, often spongy with moisture; we find also their second cousins, the liverworts.

Most of all, in wet places, we find the lowliest of our botanical meek, the algae. These living green scums and slimes fill stagnant ponds, wave in tufts in slow streams. But they also come ashore, forming green mats on the naked soil, even penetrating its upper layer and giving it the "greasiness" that makes such tricky footing.

In the end, all these lowly plants die, leaving the soil enriched and ready for the next generation. The meek have inherited—and relinquished.

Science News Letter, June 24, 1944

MEDICINE

Peritonitis Checked

Still another victory for penicillin has been achieved. Expected to save lives of appendicitis patients who cannot have immediate operations.

➤ NEWEST triumph for penicillin is over peritonitis, cause of 92% of the deaths of patients admitted to hospitals with acute appendicitis. Discovery that penicillin can save these patients comes from studies by three Navy medical officers, Lieut. Comdr. G. B. Fauley, Lieut. T. L. Duggan and Lieut. (j. g.) R. T. Stormont. The studies were reported at the meeting of the American Medical Association in Chicago.

Dogs as well as humans can get peritonitis and in a series of 27 not given penicillin, the death rate was 92.6% with an average survival time of 57 hours. No deaths occurred in 20 dogs that got penicillin promptly. Even among 19 with an 11 hour delay in giving the mold-chemical, the death rate was reduced to 21%.

Penicillin is not a substitute for operation for appendicitis by a capable surgeon, the Navy surgeons warned. Patients who are operated on promptly for appendicitis almost never develop peritonitis.

For treating peritonitis following battle wounds of the abdomen, however, and appendicitis and its complications aboard small ships, submarines and in isolated shore units where adequate facilities for immediate operation are not available, the Navy doctors believe penicillin should prove an effective aid.

Science News Letter, June 24, 1944

Vitamins May Aid Shock

➤ SOME OF the B vitamins, notably thiamin, niacin and riboflavin, may prove helpful in treating shock such as follows battle wounds, in addition to plasma and other methods of treatment. Studies showing how the vitamins may help were reported by Dr. William M. Govier, of Winston-Salem, N. C.

These vitamins can work in the body only in combined forms called coenzymes, he pointed out. Lack of oxygen due to failure of blood circulation or loss of blood apparently causes breakdown of these coenzymes, he and his associates have found. As a result, severe and sudden vitamin deficiency is added to blood loss and oxygen starvation.

Science News Letter, June 24, 1944

"Intestinal Flu" Germ

➤ AN UNKNOWN germ, possibly a virus with an affinity for the intestines, is suspected of being the cause of the condition usually called intestinal flu, Dr. Hobart A. Reimann, of Philadelphia, reported.

There may be a whole group of such viruses prone to attack the intestinal tract, he said, pointing to the discovery of such a virus in cats in 1940 and in calves in 1943. Previously no viruses known to attack the stomach and intestines primarily had been known.

The discovery of such a group of viruses, he said, would no doubt open a field of investigation of as much importance as that pertaining to the newly recognized virus infections of the nose, mouth and lungs.

The intestinal flu germ is probably spread through the air. The disease it causes is widespread, and may appear in isolated cases or in epidemics. It may be mistaken for food poisoning, influenza, bacillary dysentery and, in single acute cases, for appendicitis.

Science News Letter, June 24, 1944

• First Glances at New Books •

➤ YOU CAN follow the war with the new WAR ATLAS FOR AMERICANS, prepared with the assistance of the Office of War Information, and published for the Council on Books in Wartime in pamphlet edition and bound edition. (*Simon and Schuster,* $1 or $2.50). It contains 84 new and instructive war maps and a comprehensive explanatory text drafted under the guidance of Prof. Harold Sprout of Princeton.

Science News Letter, June 24, 1944

➤ DOWN TO EARTH, by David Greenhound, (*Holiday House,* $4.00), is a book for the layman that develops in simple, logical steps the theories and techniques of maps. It is a stimulating up-to-date survey of cartography, containing interesting facts and anecdotes. It contains directions for making maps from other maps or in the field.

Science News Letter, June 24, 1944

➤ THE PACIFIC, with the lands it touches and the islands it surrounds, has become a matter of intimate concern to all of us. We eagerly seek information now, where less than three years ago most of us were rather indifferent. To satisfy this need, yet without making too much demand on work-rushed readers' time, is the gratifying achievement of Fairfield Osborn's THE PACIFIC WORLD (*Norton,* $3). Somehow the author has contrived to get the real essentials of geography, oceanography, climate, natural history and anthropology of this vast region into an even 200 pages of text, with some excelent color illustrations and maps.

Science News Letter, June 24, 1944

Just Off the Press

ABSENCE FROM WORK, PREVENTION OF FATIGUE—*British Information Services,* 20 p., 10 cents. Conditions for Industrial Health and Efficiency, Pamphlet No. 2. Issued by the Industrial Health Research Board of the Medical Research Council.

AESCULAPIUS IN LATIN AMERICA—Aristides A. Moll—*Saunders,* 639 p., illus., $7. A detailed history of medicine in Latin America written by the Secretary-Editor of the Pan American Sanitary Bureau of Washington, D. C.

ANCIENT AND MEDIEVAL DYES—William F. Leggett—*Chem. Pub.,* 95 p., $2.25. Madder, Indigo, woad, saffron, safflower, weld, brazilwood, logwood, barwood, camwood, the fustics, orseille, cudbear, annatto, turmeric, cutch, gambir, quercitron, tyrian purple, kermes, cochineal, and lac.

ARGENTINA: Pivot of Pan-American Peace —Henry Albert Phillips—*Hastings House,* 241 p., $2.50.

AVIATION MATHEMATICS—C. A. Felker, E. A. Schweinhagen, H. W. Paine—Bruce Pub. Co., 356 p., diagrs., $2.72. Mathematics takes wings in this text which substitutes wings and motors for apples and oranges, and covers the field from common fractions to the essentials of air navigation.

DRIVER EDUCATION AND TRAINING MANUAL for High School Teachers—*American Automobile Assoc.,* 136 p., illus., Rev. ed., free to High School teachers. Includes complete teaching outlines for both classroom and behind-the-wheel training.

EISENHOWER, MAN AND SOLDIER—Francis Trevelyan Miller—*Winston,* 278 p., $2.

THE FLOWERING PLANTS AND FERNS OF MOUNT DIABLO, CALIFORNIA, Their Distribution and Association into Plant Communities—Mary L. Bowerman—*Gillick Press,* 290 p., illus., $3.75.

THE HEARST HYDRIA, An Attic Footnote to Corinthian History—H. R. W. Smith—Univ. of Cal. Press, pp. 241-290, illus., 75c. University of California Publications in Classical Archaeology, vol. 1, No. 10.

INTRODUCTION TO NAVAL ARCHITECTURE —John P. Comstock—*Simmons-Boardman,* 209 p., charts, $4.

LABORATORY EXPERIMENTS IN BIOLOGICAL CHEMISTRY—James B. Sumner, and Fred Somers—*Academic Press,* 169 p., charts, $2.60.

MYSTERIOUS LATIN INSCRIPTION IN CALIFORNIA—A. E. Gordon—*Univ. of Cal. Press,* pp. 313-356, illus., 50c. University of California Publications in Classical Archaeology vol. 1, No. 13.

OLD ORAIBI, A Study of the Hopi Indians of Third Mesa—Mischa Titiev—*Peabody Museum of American Archaeology and Ethnology,* 277 p., illus., $4.50. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University vol. 22, no. 1.

THE PACIFIC WORLD, Its vast distances, its lands and the life upon them, and its peoples—Fairfield Osborn, ed.—*Norton,* 218 p., $3.

PLASTIC HORIZONS—B. H. Weil and Victor J. Anhorn—*Jaques Cattell Press,* 169 p., illus., $2.50. Science For War and Peace Series. A useful introduction to the field with a good list of chemical equivalents to trade names.

PRINCIPLES AND PRACTICES OF INHALATIONAL THERAPY—Alvan L. Barach—*Lippincott,* 315 p., illus., $4. For physicians who wish to understand the physiologic basis as well as the technics of inhalational therapy. This gives a background for the administration of oxygen, helium, carbon dioxide, positive pressure, alternating and equalizing pressure, and the vaporized solutions of various drugs such as epinephrine, neosynephrin, and some of the sulfonamides.

PSYCHOLOGY IN LIVING—Wendell White—*Macmillan,* 333 p., $2.50. Hints from a psychologist on how to get along with other people successfully and how to achieve mental health in this disquieting world.

SHOP JOB SHEETS IN RADIO, Book II, Service Problems—Robert Neil Auble—*Macmillan,* 128 p., $1.50.

SOYBEAN CHEMISTRY AND TECHNOLOGY—Klare S. Markley and Warren H. Goss—*Chemical Pub. Co.,* 261 p., illus., $3.50.

STUDIES IN THE ANTHROPOLOGY OF OCEANIA AND ASIA—ed. by Carleton S. Coon and James M. Andrews, IV—*Peabody Museum of American Archaeology and Ethnology*—220 p., illus., $4.50. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University, vol. 20.

ZERO STORAGE IN YOUR HOME—Boyden Sparkes—*Doubleday, Doran,* 149 p., illus., $2.50. Handbook of deep freezing.

MILITARY SCIENCE

Quick Camouflaging Means Is Subject of Invention

➤ A COMPACT kind of ready-made camouflage net, designed for covering small objects and installations very quickly, is protected by patent 2,351,142, issued to Meldon Mitchell of New York City. It consists of heavy paper, cloth or other material, slotted in such a way that a pull will expand it into a coarse-meshed net, and colored with suitable concealing dyes or paint.

Science News Letter, June 24, 1944

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•New Machines and Gadgets•

❁ *SEAM MARKER is a device for marking artificial stocking seams on human legs. An elastic band above the knee and one around the ankle holds two parallel guide rods carrying a slider and pencil.*

Science News Letter, June 24, 1944

❁ *NON-SKID coating for airplane floors and stairs, already tested in service, weighs about one-fifth as much as airplane rubber matting. It is largely of ground cork and a synthetic rubber. It is applied with a spray, and is claimed to meet all ordinary aircraft requirements.*

Science News Letter, June 24, 1944

❁ *AUTOMATIC electronic oven, used to pre-heat plastic materials to ready them for molding, uses the "pop-up" idea of the automatic bread toaster. At the end of the required interval an electronic control trips a latch on this cabinet-shaped oven, pops the lid open, and cuts off the heating current.*

Science News Letter, June 24, 1944

❁ *ELECTRIC vibrating cutting tool, portable and small enough to be held in one hand, cuts letters and lines on the hardest materials, including laboratory glass and porcelain. The cutting point, made of tungsten carbide or diamond, makes 120 vertical strokes per second.*

Science News Letter, June 24, 1944

❁ *PORTABLE electric sander, for smoothing and polishing wood, metal and plastic, is furnished with several sanding surfaces with different grades of abrasives which may be changed in*

a jiffy. The sanding surface or pad of this device, pictured above, is flexible to conform to slightly curved surfaces.

Science News Letter, June 24, 1944

❁ *POUR CAPS for bottles, just patented, are quickly attached to the tops so that contents may be poured without spilling. The cap, with a pouring spout, fits tightly over the top of the milk or other bottle, and an attached handle is held by spring clamps to the bottle's center.*

Science News Letter, June 24, 1944

❁ *AUTOMOBILE canvas hammock swings between the back of the driver's seat and a fixed stand in the rear of the baggage compartment. The back of the rear seat is turned upward out of the way. When not in use the canvas folds over the front seat. An injured person can be put in from the rear.*

Science News Letter, June 24, 1944

❁ *PLATINUM WIRE, so fine that only its shadow can be seen with the naked eye, is being used experimentally in a research laboratory. It is made by drawing out thin silver wire with a platinum core; then the silver is eaten away with nitric acid.*

Science News Letter, June 24, 1944

❁ *HELIUM-SHIELDED arc-welding electrode holder, for use in welding magnesium and other light metals, has a plastic handle, steel gas nozzle, copper electrode clamp, and a thumb button for controlling the gas supply. The helium shield protects the metals from oxidation.*

Science News Letter, June 24, 1944

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 213.

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Question Box

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What is the Navy's new secret weapon? p. 405.

ASTRONOMY

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CHEMISTRY

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What is the newest triumph for penicillin? p. 410.

PALEONTOLOGY

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PUBLIC HEALTH

How is a drug being used to cut down loss of manpower in the Army? p. 405.

How will the children of America profit from the Red Cross blood drive? p. 403.

Where is penicillin being tried for syphilis? p. 404.

Where published sources are used they are cited.

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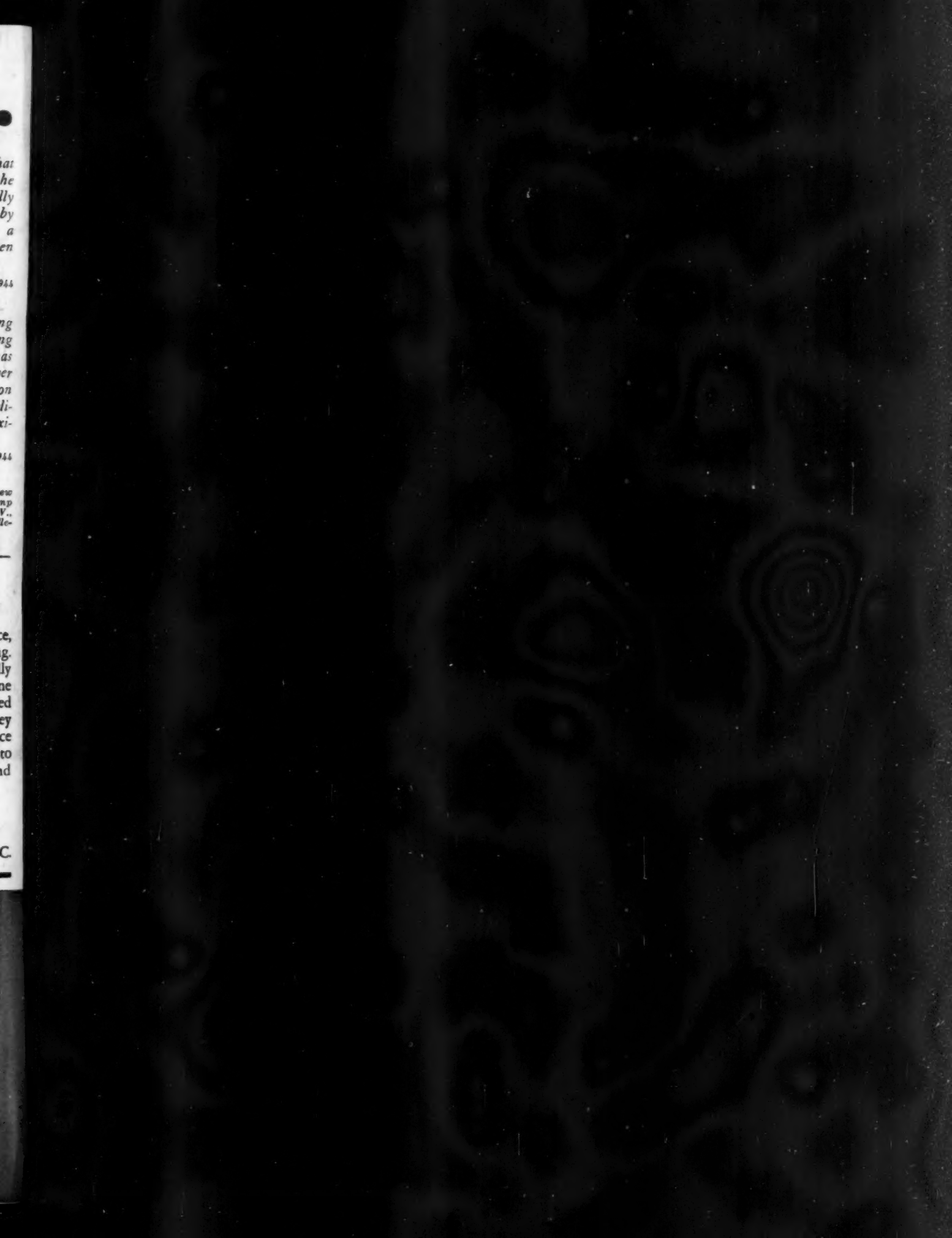
In requesting change of address please give your old address as well as the new one, at least two weeks before change is to become effective.